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EXAMINER

JAMAL, ALEXANDER

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2643

DATE MAILED: 07/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/029,323

Applicant(s)

HAGN, PETER

Examiner

Alexander Jamal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Based upon the submitted amendment (5-9-2005), the examiner notes that claims 1,7,8,14,18,19 have been amended and claims 24-29 have been added.
2. Examiner withdraws objections to claims 18,19, and further withdraws the 35USC 112 rejections to claims 6-8, 14.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. **Claims 4,25,14** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per **claim 4**, claim refers to a switch to enable switching for a TDD mode. The newly amended claim 1 only mentions a pure FDD mode and mixed TDD/FDD mode. It is not clear whether the 'TDD mode' of claim 4 refers to an additional 'pure TDD' interface or the mixed mode TDD/FDD interface. For the purposes of examination, examiner assumes the TDD mode refers to the mixed TDD/FDD mode.

As per **claim 25**, claim 25 references a switch to implement switching for a TDD mode. The new claim 25 mentions a pure FDD –or- a pure TDD mode and mixed TDD/FDD mode. It is not clear whether the 'TDD mode' of claim 4 refers to an

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additional 'pure TDD' interface or the mixed mode TDD/FDD interface (in the case that a pure FDD mode is part of the interface. For the purposes of examination, examiner assumes the TDD mode refers to the mixed TDD/FDD mode.

As per **claim 14**, claim mentions filters implemented as 'independent components'. It is not clear (nor is there any mention) from the specification what is entailed in producing a filter that is an 'independent component'. In fact, applicant's specification teaches towards integrating the components and removing 'independent components' (page 16) and further discloses that independent components are only executed with their function (page 15).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1,20-22,24,26,27,2,3,5-7,9-11,15-17,23,28,29** rejected under 35 U.S.C. 103(a) as being unpatentable over Hagstrom (6185434).

As per **claim 1**, Hagstrom discloses a front end for a multi-mode cell phone comprising RF switch elements 14,42,43 (Fig. 5, Col 5 lines 44-67). The system further comprises common antenna 21, mixed mode (GSM) filters 13a and 18a, and a DECT interface (pure mode TDD), and filters 13b and 18b. The filters are coupled to the

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common antenna via the switches 14 and 43. Additionally, Hagstrom discloses that the bandpass filters used in Hagstrom may be switchable bandpass filters (Col 7 lines 25-36). Examiner also notes that Fig. 4 of Hagstrom also reads on claim 1. However, Hagstrom does not specify that the interface comprises a pure FDD mode interface.

Hagstrom additionally discloses that the system is not limited to specifically one GSM (mixed mode) and one DECT mode, but may be implemented with other known dual mode apparatuses (Col 7 lines 9-26). It would have been obvious to one of ordinary skill in the art at the time of this application to implement any combination of known band-pair systems (GSM, FDD/TDD, DECT, pure FDD, or pure TDD), including the associated switching and filtering circuitry for the advantage of providing maximum compatibility with the system in which the phone is to be used.

As per **claims 20-22**, claims rejected for same reasons as claim 1 rejection. As it is a multi-mode telephone, it may function in a third generation system (Col 1 lines 1-34), or in the previous second generation system (by using just one of the modes).

As per **claim 24**, Hagstrom discloses a multi-mode interface as per the claim 1 rejection, however, Hagstrom does not disclose the system of Fig. 5 supporting multiple modes where the modes have overlapping/adjacent frequency ranges.

Hagstrom discloses that his inventive system is a reduced sized, combined filter that is capable of implementing multiple modes wherein each mode is in a separate and spaced frequency range. Hagstrom additionally discloses that separate filters and switching

elements may be implemented (as in prior art Fig. 4) to support multi-mode systems, and also that antenna switches may be used to support communication in the cases where the signaling used has overlapping frequency ranges (Col 2 lines 35-45). It would have been obvious to one of ordinary skill in the art at the time of this application that a design tradeoff could be made in designing the interface, either a system with lower part count (taking up less space) could be designed with the limitation on the frequency ranges of the modes supported, or the system could have a greater amount of switches/filters and be able to support modes with overlapping frequency ranges (greater compatibility with various networks).

As per **claim 26**, claim rejected for same reasons as claim 1 rejection, the triplex filter comprises a diplexer. The bandpass filters of the triplex filter comprise high and low pass filters as a bandpass filter is inherently (by definition) comprised of a high and low pass filter.

As per **claim 27**, claim rejected for same reasons as claim 1 rejection.
Additionally, claim 27 rejected for same reasons as claim 24 rejection.

As per **claim 2**, claim rejected for same reasons as claim 26 rejection. The band pairs are separated by an octave (Col 1 lines 25-30).

As per **claim 3**, claim rejected for same reasons as claim 1 and 2 rejections.
Hagstrom discloses an RF switch in Fig. 4 that is used to separate the band pairs.

As per **claim 5**, the system (Fig. 5) further comprises filter 13a which is a bandpass filter. A bandpass filter inherently (by definition) comprises the functionality of a high-pass filter and a low-pass filter.

As per **claim 6**, the system may comprise a duplexer that comprises an RF-switchable bandpass filter (Col 7 lines 25-36).

As per **claim 7**, claim rejected for same reasons as claim 6.

As per **claim 9**, Hagstrom discloses that the system may be implemented with additional parallel system (band pairs) operating DECT, GSM or any other compatible known signaling format (Col 7 lines 9-25).

As per **claims 10,11**, any additional band pairs would inherently comprise RF switches, duplexers, and diplexors for each band pair in the same manner described in Fig. 5 for the purpose of allowing the additional band pair to function as the band pairs of Fig. 5.

As per **claim 15**, the system may be implemented in a substrate with with soldering pads (for discrete components), which is a printed circuit board (Col 6 lines 5-35).

As per **claims 16,17**, the system inherently comprises a DC drive for the purpose of providing power and bias to all the circuitry. The system further comprises a printed circuit board (common, multi-layer substrate) for the purpose of supporting and coupling (integrating) all the components of the circuit. The printed circuit board comprises partially planar structures (traces and vias and soldering pads) (Col 6 lines 6-35).

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As per **claim 23**, claim rejected for same reasons as claim 1 rejection (switch 43).

As per **claim 28**, claim rejected for same reason as claim 24.

As per **claim 29**, claim rejected for same reasons as claim 14 (listed below). The triplexer comprises a duplexor.

7. **Claims 25,4,8**, rejected under 35 U.S.C. 103(a) as being unpatentable over Hagstrom (6185434) as applied to claims 1-3,27 and further in view of Minarik (6018644).

As per **claims 25,4,8**, Hagstrom discloses applicant's claims 1-3,27 and discloses two RF switches 41 and 14a (Fig. 4) used to separate the band pairs (switch 41) and enable TDD switching (Switch 14a). Additionally, the system described in the claim 24 rejection discloses switches 41 and 14a (Fig. 4) used to separate the band pairs. However Hagstrom does not disclose the use of a multi-switch in place of switches 41 and 14a.

Minarik discloses an RF multi-switch 26 (Fig. 1) used in a radio system front-end. It would have been obvious to one skilled in the art at the time of this application that switches 14a and 41 in Hagstrom could be implemented as a multi-switch for the purpose of lowering part count (manufacturing cost).

8. **Claims 12-14** rejected under 35 U.S.C. 103(a) as being unpatentable over Hagstrom (6185434) as applied to claim 1, and further in view of Burgess (6459885).

As per **claims 12,13**, Hagstrom discloses applicant's claim 1 and the use of RF switches. However, Hagstrom does not specify what type(s) of switches are used.

Burgess discloses a radio transceiver switching circuit comprising RF switches made from GaAs FET transistors or PIN diodes with additional phase shifters (capacitors) (Col 1 lines 15-65). It would have been obvious to one skilled in the art at the time of this application that the switches could be made with GaAs FET transistors or PIN diodes for the purpose that they are well known switch implementations that are effective in RF mobile phones.

As per **claim 14**, claim rejected for same reasons as claim 12,13 rejections. Additionally, Hagstrom discloses that the triplex filter (which may comprise RF filters and duplexers) may be implemented as stripline filters (Col 6 lines 25-35). Additionally, Fig. 5 of Hagstrom (as per the claim 1 rejection) discloses further filters 13a,13b,18a,18b and Fig. 4 of Hagstrom (as per claim 24 rejection) discloses filters 41 and 14a.

9. **Claim 18** rejected under 35 U.S.C. 103(a) as being unpatentable over Hagstrom (6185434) as applied to claim 1 and further in view of Waldroup et al. (6070058).

As per **claim 18**, Hagstrom discloses applicant's claim 1 and power amplifiers on the transmission path (Fig. 5). However, Hagstrom does not specify that the system comprises a directional coupler to regulate the power amplifier.

Waldroup discloses a radio transceiver comprising a directional coupler 50 (Fig. 1). Used to regulate a power amplifier (ABSTRACT). He teaches that this allows for a

more efficient use of battery power (Col 1 lines 29-50). It would have been obvious to one skilled in the art at the time of this application to implement the additional power amp regulation for the purpose of conserving battery power.

10. **Claim 19** rejected under 35 U.S.C. 103(a) as being unpatentable over Hagstrom (6185434) as applied to claim 1 and further in view of Kurchuk et al. (6272327).

As per **claim 19**, Hagstrom discloses applicant's claim 1. However, Hagstrom does not specify that the system comprises a circulator arranged between the transmission amplifier and the antenna.

Kurchuk discloses a radio phone comprising circulator 350 (Fig. 6) (Col 9 lines 35-50). It would have been obvious to one skilled in the art at the time of this application to implement the circulator in Hagstrom's system for the purpose of protecting the transmitter from reflections.

Response to Arguments

11. Applicant's arguments with respect to **claims 1-19,24-29** have been considered but are moot in view of the new ground(s) of rejection.
12. Applicant's arguments filed 5-9-2005 have been fully considered but they are not persuasive.

As per applicant's argument's concerning Hagstrom not implementing a pure FDD mode (remarks pages 16-17), examiner again points to (Col 7 lines 2-25) where

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Hagstrom discloses that the system is not limited to GSM and DECT systems but any dual mode systems. Hagstrom discloses that there are many different types of networks that may employ FDD, TDD or mixed mode TDD/FDD interfaces (Col 1 lines 10-50).

As per applicant's argument (remarks page 15) concerning a bandpass filter not comprising a high and low pass filter examiner disagrees. Applicant uses the term 'comprising' in all claims referring to the filters and as such, examiner contends that a bandpass filter is combination of components (hence 'comprises') that produces a frequency response of both a highpass and low pass filter acting together.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

AJ
July 14, 2005


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